ABSTRACTS OF 9 PROJECTS, Alphabetical by First PI Name
* Indicates a collaborative project with multiple institutions.
Only the first PI's institution is shown.

CNS-0420533
PI: Margaret M. Burnett
Institution: Oregon State University
Title: Gender HCI Issues in Problem-Solving Software

This project investigates the role software plays in supporting or inhibiting the participation of women in information technology. The project involves empirical studies on research questions about the impacts of gender differences in confidence, of gender-conscious support mechanisms, of gender differences in motivation, and of collaboration opportunities by males and females using problem solving software. The investigators plan to produce guidelines to help designers of problem-based software environments make design decisions that account for gender differences.

CNS-0420365*
PIs: Donald Davis, Sandra DeLoatch, Janis Sanchez-Hucles, and
Debra Major
Institutions: Old Dominion University + others
Title: Creating an Inclusive Learning Environment: Enhancing Retention of
Women and Minorities in Computer Science

Old Dominion University and Norfolk State University have been awarded an ITWF grant to conduct a collaborative four-year implementation project designed to create an inclusive learning environment in computer science (CS) and thereby increase retention of women and minority undergraduate students. The two institutions will create an inclusive learning environment through (a) strengthening faculty-student and student-peer relationships using collaborative and multicultural teaching and learning practices and (b) strengthening student self-efficacy, optimism, career management, and collaboration and coping skills. All beginning CS students will participate in a required, semester-long class that presents a realistic preview of the challenges of being a computer science major, techniques and skills for coping with such challenges, training in attitudes and beliefs that foster persistence, and use of role models to describe the career rewards that are possible in computer science. Faculty will be trained in "wise schooling" techniques to foster inclusiveness. Faculty will also include pair programming and collaborative learning in programming classes.

CNS-0420485
PIs: Juan E. Gilbert, Lamont A. Flowers, James L. Moore, and

Bevlee A. Watford
Institution: Auburn University
Title: ITWF: Scholars of the Future: An Implementation Model for Increasing Diversity in Information Technology

This ITWF project provides significant research and mentoring to upper level undergraduate computer science students, with a focus on under-represented participants. The goal is for these students to pursue graduate degrees in information technology related fields and then pursue academic careers. This Scholars of the Future model is to be implemented at Auburn University all four years and at Virginia Polytechnic Institute in the last two years. The student research covers a broad spectrum of the information technology disciplines, with leadership and mentorship from recognized scholars in the various fields. The project features a comprehensive assessment plan that should provide research-based insights that are of great value.

CNS-0420436*
PIs: Susan Horwitz, Maureen Biggers, David Binkley, Hubert Dunsmore,
Institutions: University of Wisconsin + others.
Steven Huss-Lederman, Ethan Munson, Susan Rodger, and Barbara Ryder
Title: ITWF Collaborative Research: Increasing the Representation of Undergraduate Women and Minorities in Computer Science

This collaborative ITWF project implements a new approach to introductory computer science with the goal of increasing the enrollment and retention of women and under-represented minorities in undergraduate computer science degree programs. The project adapts the Emerging Scholars Program and the Peer-led Team Learning approaches, which have been proven successful in mathematics and other sciences, to computer science. It is a collaborative project between the University of Wisconsin-Madison, Beloit College, Duke University, Georgia Institute of Technology, Loyola College of Maryland, Purdue University, Rutgers University, and the University of Wisconsin-Milwaukee. The project includes targeted recruitment of students with strong mathematics and science backgrounds to the new course. The course includes students working in small groups on challenging problems with group facilitation by outstanding undergraduates.

CNS-0420505*
PIs: Samuel Kamin, Mary Califf, Joy Lucht, Maria Mobasseri, Vladimir Uskov, Nancy Van Cleave, and Tim L. Wentling
Institutions: University of Illinois, Urbana-Champaign + others
Title: ITWF Collaborative Research: Building Communities: Recruiting and Retention of Underrepresented Groups in Computer Science

This collaborative ITWF project implements a set of activities designed to increase participation of women and under-represented minorities in undergraduate computer

science programs in the state of Illinois. The project includes high school outreach, curriculum reform, mentoring, and other extracurricular activities. It is a collaborative project between the University of Illinois at Urbana-Champaign, Illinois State University, Heartland Community College, Parkland College, Bradley University, and Eastern Illinois University. The project involves building communities among various groups within the state to recruit, support, and retain students in computing courses and programs.

CNS-0420473
PIs: Sharad K. Maheshwari, Judith M. Davis, Edward Hill, and Anne L. Pierce
Institution: Hampton University
Title: BRACE: Bridging Research and Curriculum Experience

Hampton University has been awarded an ITWF planning grant to work with Norfolk State University and Virginia State University to examine why minority students at their three institutions do not pursue graduate study in information technology (IT). Preliminary graduation and alumni data of the computer science (CS) and computer information systems (CIS) majors from the three participating institutions show that there is a substantial gap in the number of students pursuing graduate study in these disciplines. Planning activities will include the identification of interventions addressing specific critical needs, and the creation of a repository of best practices.

CNS-0420448
PIs: Raghav Rao, Sharmistha Bagchi-Sen and Shambhu J. Upadhyaya
Institution: SUNY Buffalo
Title: ITWF: Women and Cyber Security: Gendered Tasks and Inequitable Outcomes

This ITWF project examines the entry, retention, and advancement of women in cyber security information technology careers. The project involves studies on undergraduate and graduate recipients of Department of Defense scholarships, current cyber security professionals who hold professional certification, and a group of women who are chief information security officers in American companies. The goals are to determine possible trends of task differentiation by gender and to determine possible institutional interventions that can promote gender equity in the critical field of cyber security. The project includes partnership with Buffalo State College to pilot outreach activities targeted at girls in middle and high school, thus widening the pool of females who may then actively pursue careers that combine IT and cyber security.

CNS-0418165*
PIs: Wanda J. Smith, Kermith V. Harrington, and France Belanger
Institutions: Virginia Polytechnic Institute + others

Title: ITWF Collaborative Research: African-Americans in IT: Improving the Graduate Education and Workforce Pipelines

Virginia Polytechnic Institute and Radford University have been awarded an ITWF grant to conduct a collaborative research and implementation project whose primary goal is to promote and enhance the retention of African-Americans in the information technology (IT) workplace and professoriate. A model of Information Technology Career Resilience (ITCR) has been developed that describes how students select, persist in, and graduate from IT educational programs and then make the transition to the professoriate or the IT workplace. This model integrates the strengths of three widely validated research perspectives: student retention, student involvement and attraction-selection-attrition. A three-year longitudinal study will collect data on social integration, academic major integration, IT-related factors, student characteristics, social integration, IT career resilience, job factors, organizational characteristics, values, the recruitment process, and satisfaction and retention. A range of sophisticated statistical techniques including hierarchical multiple regression, multiple discriminate analysis, and structural equation modeling techniques, will be used to test the ITCR model and its applicability to African-Americans.

CNS-0420434
PIs: Jeffrey M. Stanton and Debra Eischen
Institution: Syracuse University
Title: ITWF: Culture Clash! The Adverse Effects of IT Occupational Subculture on Formative Work Experiences of IT Students

This ITWF project explores possible adverse influences of the information technology occupational subculture on students in higher education and possible ways to counteract them. It includes a longitudinal analysis of the occupational culture expectations, sources of information, and perceptions of IT students over time. Models developed from the longitudinal analysis are then tested in a cross sectional study of diverse IT students. Finally, an inoculation intervention is applied and assessed in a set of workshops to ascertain the extent to which students can be prepared for the subculture stresses they might experience during their formative work experiences.